

1 What is Claimed Is:

2 1. A communications system comprising:  
3 a base station having an adaptive antenna with a plurality of main array  
4 antenna elements for generating a plurality of communication beams; and  
5 a gateway station coupled to said base station, said gateway station  
6 forming a plurality of beams commands by communicating a plurality of control  
7 signals to the base station to form the communication beams.

1 2. A communications system as recited in claim 1 wherein said  
2 adaptive antenna comprises a plurality of panels comprise the plurality of main array  
3 elements.

1 3. A communications system as recited in claim 1 wherein said  
2 base station comprises a plurality of auxiliary elements for canceling interference  
3 between the communication beam.

1 4. A communications system as recited in claim 1 wherein said  
2 auxiliary elements are weighted to provide interference canceling.

1 5. A communications system as recited in claim 1 wherein said  
2 gateway station is rf coupled to said base station.

1 6. A communications system as recited in claim 1 wherein said  
2 base station is wireless.

1 7. A communications system as recited in claim 1 wherein said  
2 gateway station is positioned on a stratospheric platform

1 8. A communications system as recited in claim 1 wherein said  
2 reconfigurable antenna comprises a phased array antenna.

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1                   9.     A communications system as recited in claim 1 wherein said  
2     main array is a modular.

1                   10.    A communications system as recited in claim 1 wherein said  
2     main array comprises a plurality of modules coupled to a bus.

1                   11.    A communications system as recited in claim 1 wherein said  
2     bus is coupled to a controller.

1                   12.    A communications system as recited in claim 1 further  
2     comprising a plurality of users receiving said communications beam.

1                   13.    A communications system as recited in claim 1 further  
2     comprising a limiter coupled within a feedback path.

1                   14.    A communications system as recited in claim 1 further  
2     comprising a nulling processor.

1                   15.    A communications system as recited in claim 14 wherein said  
2     nulling processor comprises an element code despread and a user code despread.

1                   16.    A communications system as recited in claim 15 wherein said  
2     nulling processor comprises a weighted feedback loop similarly coupled to an output  
3     signal.

1                   17.    A communications system as recited in claim 15 wherein said  
2     nulling processor comprises auxiliary elements coupled to an output signal.

1                   18.    A communications system as recited in claim 1 wherein said  
2     base station comprises a plurality of summing blocks coupled to said main array  
3     element for generating a summed signal, said gateway station comprising an analog-  
4     to-digital converter coupled to a noise injection circuit and said summed signal, said  
5     summed signal coupled to a demultiplexer and a digital beam forming circuit.

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1                   19. A communication system as recited in claim 1 wherein said  
2 base station comprises a user code despreading circuit coupled to an element code  
3 despreading circuit which is coupled to said main array elements.

1                   20. A communications system comprising:  
2 a plurality of wireless base stations having adaptive antennas with a  
3 plurality of main array antenna elements for generating a plurality of communication  
4 beams;

5 a gateway station coupled to said plurality of wireless base stations  
6 through a plurality of multiple dynamic links, said gateway station forming a plurality  
7 of beams with a plurality of data packets by communicating plurality of a control  
8 signals to the base station to form the communication beams using at least one link  
9 from a first base station and a second link through a second of the base station.

1                   21. A method of operating a communication system having a  
2 gateway station and a plurality base station comprising:

3 dividing a communication signal into a plurality of multiple dynamic  
4 links at the gateway station;

5 directing the multiple dynamic links to a plurality of base stations; and

6 coupling the multiple dynamic links through the plurality of base  
7 stations.

1                   22. A method as recited in claim 21 further comprising canceling  
2 interference between said multiple dynamic links.

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